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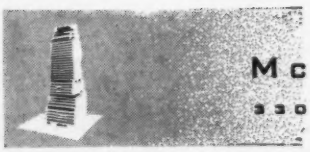

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The JOURNAL *of* GEOGRAPHY

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Dr. White is Head of the Department of Geography at Stanford University. In 1947-1948 he was visiting professor of human geography at San Marcos University in Lima, Peru, and lecturer in geography at the Instituto de Geografía. While in Peru he traveled widely, studying in the coast, the montãna, and the sierra, the latter most intensively. The present article grew out of this work.

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Mrs. Harbeson has had twenty-eight years of teaching experience in the counties of western Indiana. Five years of her experience has been in the rural schools. She is now teaching in the intermediate grades at Waveland, Indiana. During recent years she has had several articles in the *Grade Teacher.*

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Dr. Roucek is Chairman of the Department of Sociology and Political Science in the University of Bridgeport, Bridgeport, Connecticut. He is editor and co-author of such books as *Slavonic Encyclopedia, Central Eastern Europe, Balkan Politics, Contemporary Europe.*

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Dr. Vinge is Associate Professor at Michigan State College, East Lansing, Michigan. During recent years, he has published articles and book reviews in the *Scientific Monthly, School Science and Mathematics* and the JOURNAL OF GEOGRAPHY. His interest in the Mercator grid and navigation stems largely from pilot experience in the USAF during the last war.

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Dr. Phillips is the Wilson Professor of Economics and Head of the Department of Economics at Washington and Lee University. He has contributed articles to *Economic Geography* and other periodicals, and, with J. Russell Smith, is co-author of *North America* and *Industrial and Commercial Geography.*

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VOLUME L JANUARY, 1951 NUMBER 1

HUANCAYO AND ITS FAMOUS INDIAN MARKET IN THE PERUVIAN ANDES

C. LANGDON WHITE
Stanford University

There is no more colorful region in the world than the Peruvian *sierra* with its millions of Indians, descendants of the once-great Inca civilization. One is not exaggerating when one says that every hamlet, village, town and city is interesting, even fascinating. Never-to-be-forgotten pictures leap into the mind of him who knows the sierra by the mere mention of such places as Pisac, Cuzco, Puno, Ayacucho, Tarma, Huanuco, Huarás, Cajamarca, Otuzco, Huancayo and scores of others.

No mountain city is visited by so many foreigners as Huancayo, which lies only 216 miles inland from Lima, and 77 miles southeast of Oroya (Fig. 1). Since almost every tourist going to Peru visits Lima (and often no other coastal cities), since Huancayo is easily accessible from Lima both by rail and highway, and since its Sunday market is famous over the entire West Coast, relatively few tourists miss it.

Most tourists go to Huancayo via the Ferrocarril Central de Perú, one of the most famous railroads in the world, and man's greatest feat in standard-gauge railway construction. The road was built by Henry Meiggs—"Yankee Pizarro"—in the late 1860's and early 1870's, and the part from Oroya to Huancayo was completed in 1908 (Fig. 1). No standard-gauge railroad was ever built thru more stubborn terrain. No description, however vivid, and no photograph, however true, can give a clear concept of the overwhelming obstacles that had to be overcome in building this railway.

Within a course of 138 miles, the route includes 61 bridges, 65 tunnels, 21 simple switchbacks and 5 zig-zag or compound switchbacks. At times, several switchbacks are employed in climbing a

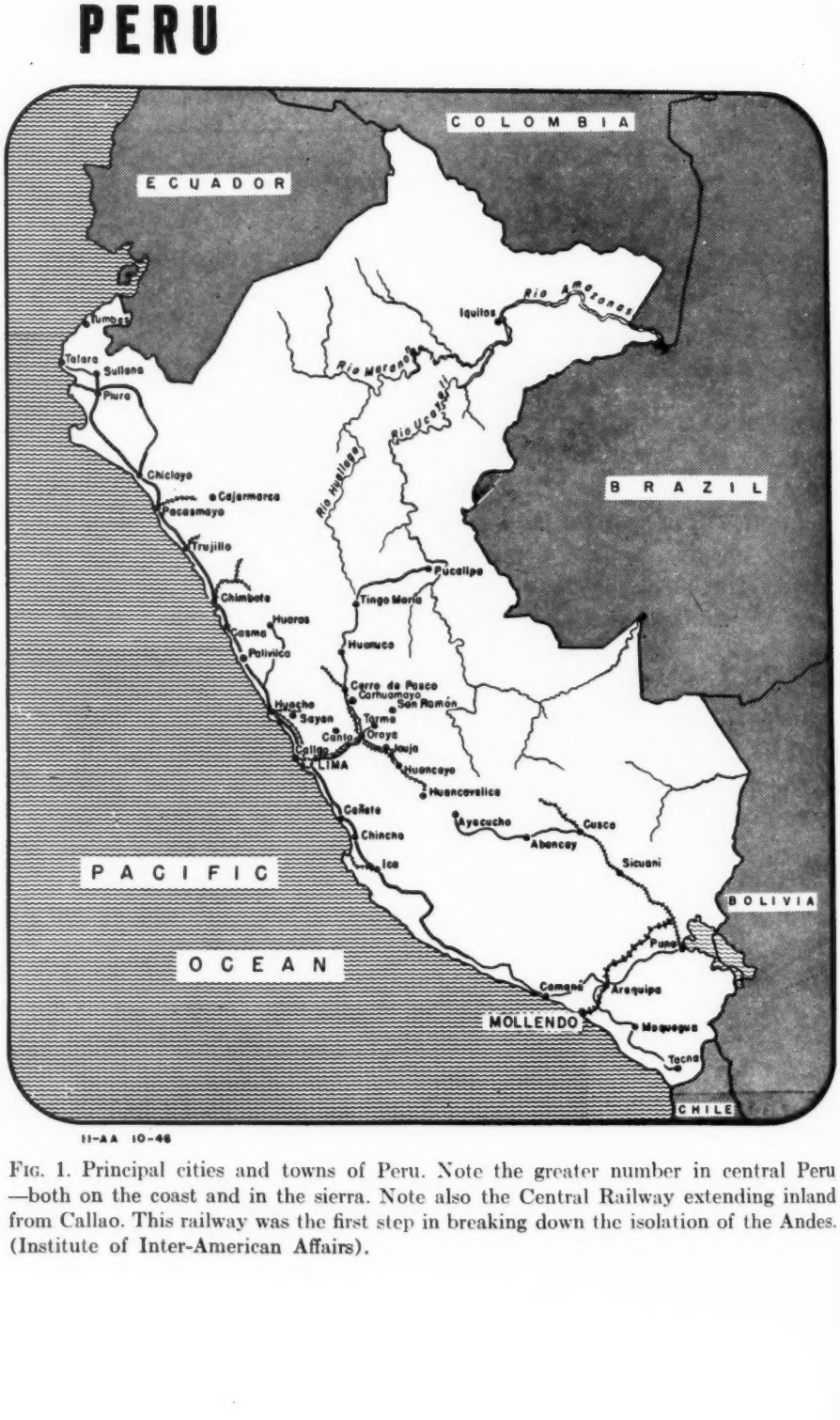

FIG. 1. Principal cities and towns of Peru. Note the greater number in central Peru —both on the coast and in the sierra. Note also the Central Railway extending inland from Callao. This railway was the first step in breaking down the isolation of the Andes. (Institute of Inter-American Affairs).

single forbidding mountain. The highest point reached is at Ticlio (Fig. 1), whose altitude is 15,692 feet, and close to the continental divide. Approximately twelve hours after leaving Lima, the train arrives in Huancayo. Huancayo is on the east bank of the Rio Mantaro on the alluvial floor of the fertile and productive Jauja Valley, located at an elevation of 10,500 feet above sea level. Its

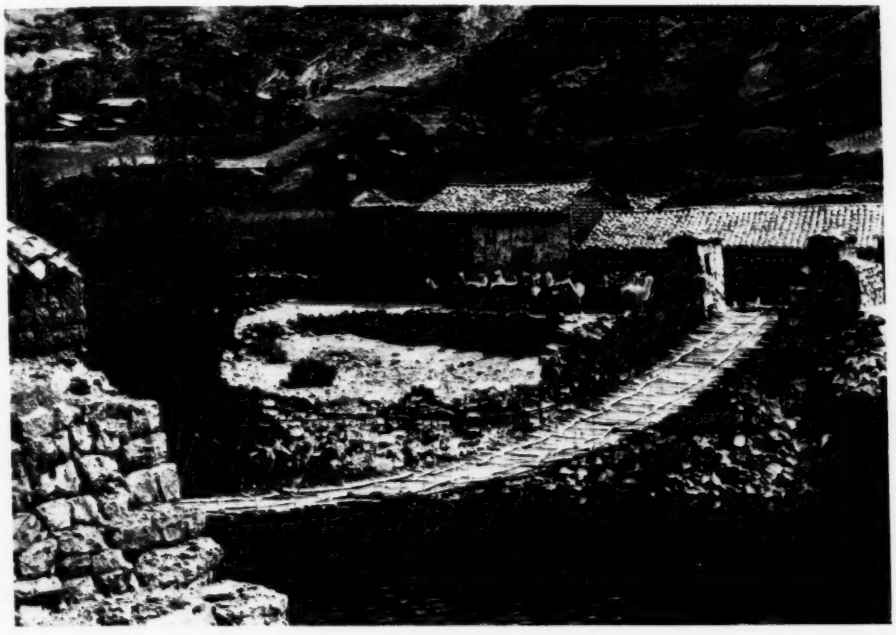

FIG. 2. A rural scene near Huancayo. Thruout the sierra, the Indians are a medieval survival. Almost their whole mode of life is of the past; their homes, their modes of transport, their system of farming, their food, their dress. It is difficult to conceive of a more colorful and picturesque cultural landscape than that in the sierra. (Courtesy of Runci).

tributary area is quaint and colorful (Fig. 2) and it is surrounded by productive fields of maize, wheat, barley and alfalfa.

Huancayo boasts a population of more than 30,000 inhabitants. It is not old compared with Cuzco, Cajamarca and other cities, tho its origin is lost in obscurity. It is, however, one of the most, if not the most, progressive cities in the Peruvian *sierra*, and promises to become the metropolis of central highland Peru.

Originally, Huancayo was just a long street—the Calle Real of the Incas, built to connect the northern capital of Quito with the

southern capital of Cuzco. One Spanish writer[1] in the early 17th century refers to Huancayo as an "Indian village." It was of little importance during the Colonial Period, and was not considered a city until 1822. Shortly after this date, however, Huancayo began to play a prominent role in Peruvian life, the nation's independence having been proclaimed in its plaza. On three occasions during the troubled 19th century, Huancayo was the provisional capital, and during the War of the Pacific (1879-1883) was occupied by Chilean forces. It is today the capital of Junin Department.

The city's population is comprised of Indians, whites and mestizos, but the mixed bloods (mestizos) predominate numerically.

Huancayo is no backward highland city, nor can it boast of great Inca and pre-Inca cyclopean structures as can Cuzco. Its buildings are relatively new and substantial, and it has all the modern conveniences. For five days a week, it works in the atmosphere of the 20th century; on Saturday afternoon and Sunday morning and early afternoon the cloak of the 20th century (modernity) is cast aside, the clock turns back, and Huancayo returns to Inca days to its great Sunday market.

Brief History of Indian Markets

Markets have been held in Peru for centuries—long before the arrival of Pizarro, and their importance to the people of the *sierra* is no doubt as great as ever. Thousands of persons (between 10,000 and 12,000), mostly Indians, attend the Sunday market in Huancayo. The town plaza is generally the meeting place. In Inca times, transactions were limited solely to barter, for this civilization never had a monetary system; thus one woman would exchange maize (corn) for quinoa or potatoes; potatoes for llama meat; or chili for salt. Such transactions still are common, tho definitely declining.

Markets are held somewhere every day in the week except Tuesday (Tuesday is reputed to be an unlucky day and the Indians are very superstitious). All kinds of products are exchanged and sold—products drawn from the entire *sierra* as well as from the *costa* and the *montaña*. A complete inventory would include too many items for this short article, but several representative ones are corn (ears and kernels of many sizes and colors); numerous

[1] Oscar O. Chávez, *Huancayo*, Vol. I, Huancayo, Peru, 1926.

FIG. 3. Hat section in the Huancayo Sunday market. Hats are as important in the lives of Andean women as in those of American women. (Courtesy of Panagra).

varieties of potatoes, fresh and dehydrated (chuño); quinoa (an ancient crop of the Andes and regarded as sacred by the Incas); yuca or manioc; oca (a tuber-producing plant of the high Andes); ají or peppers; preserved and salted meat; peanuts, small dried fish, coca, beans, wheat, barley, eggs, live chickens and pigs, fruits of many kinds, wool in the grease, dyed wool, tanned skins and hides, pottery, cloth, straw mats, decorated gourds, woolen and straw hats, cheeses, rugs, wooden spoons, medicines (including

herbs, minerals, parts of animals, sea shells, etc.); silver filigree, cheap glassware, old bottles, second-hand books and many others.

The Huancayo Market

This market is the largest and most diversified in all highland Peru. It serves people with simple wants and a very small purchasing power, tho numerous tourists also attend.

One of the most impressive aspects of all Indian markets is the

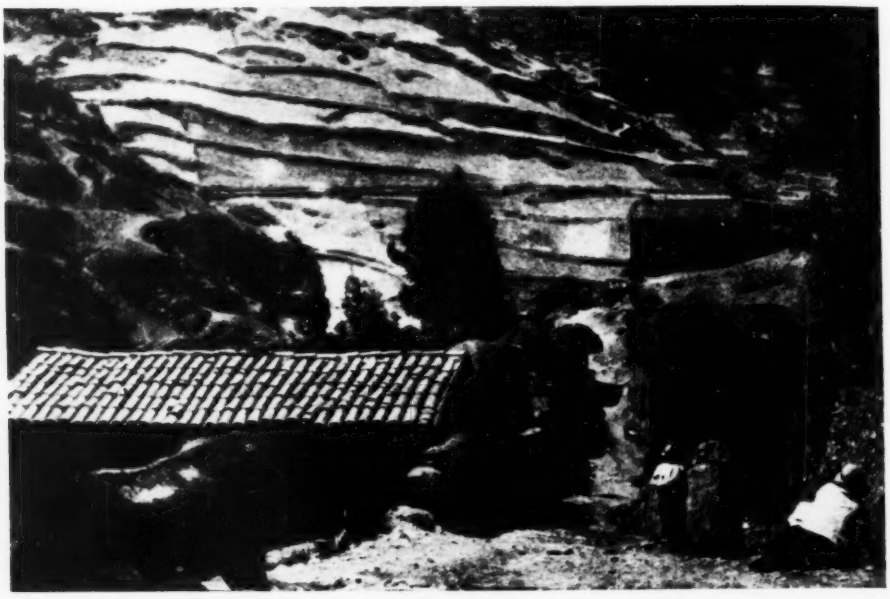

Fig. 4. Typical houses and village near Huancayo. Indians—men and women—walk everywhere, thinking nothing of walking very great distances. The paucity of flat land has forced man to grow many of his crops on steep slopes. (Courtesy of Runci).

pettiness of the transactions and the small assortment of goods —even the small quantity of them. This is because the Indian is merely trading his agricultural surplus or a few handicraft articles (made one wonders when, for the mountain women seem always to be busy) for a part of the surplus of another Indian. Thus each increases the variety of goods he will use. The average Indian makes very little money at a market; few accumulate as much as fifty *soles* (about $10 U.S.)

On Saturday afternoon all roads leading into Huancayo are alive with Indians on their way to the market. Many walk, and

many ride on donkeys, horses, trucks, buses and trains. They come from nearby villages, from remote lofty punas, from the fringes of the jungle and even from the coastal valleys. Many of them who walk are accompanying their llamas, which they lead by a neck rope. The llama carries generally about sixty-five pounds. Many Indians, however, pack their wares on their own backs.

All night long one hears the hoof beats of the donkeys and llamas on the hard-surfaced streets. Doorways and other sheltered

FIG. 5. Threshing wheat by tramping near Huancayo. This is a common scene thruout the region. (Courtesy of Institute of Inter-American Affairs).

places in the streets serve as temporary lodgings for the poorest. Some stop in *tambos* (third- or fourth-class inns). Tambos have patios off a narrow street with small rooms off the patio. A whole family and its livestock may remain overnight in a single room!

On Sunday morning, this street is closed to motor traffic. At dawn the whole street comes to life and teems with humanity—mostly Indians. This is the market place! It is this colorful sight that takes one out of the 20th century and back to the 16th or 17th[2]

[2] C. Langdon White, "Out of This World," *Pacific Discovery* (California Academy of Sciences), Vol. II, May-June 1949, pp. 4-15.

(Fig. 3). In a single block one sees shepherds from Choclococha, miners from Morococha, hacendados from Ayacucho, farmers, soldiers, priests—a complete cross section of the population of the sierra. The area tributary to Huancayo is predominantly Indian in composition and it is here that we turn back the clock (Figs. 4 and 5). The Indian costumes are colorful, tho less so than formerly, and certainly less so than those worn by the Indians attending Pisac's Sunday market (Fig. 6).

Fig. 6. Indian family at Pisac near Cuzco. The children are almost exact replicas in dress of their mothers and fathers. Mothers and daughters usually go barefoot, but fathers and sons wear sandals. The details of dress reflect regional differences. (Courtesy of Guillén).

The women wear layer upon layer of skirts of gay colors—orange, red, yellow, blue and green—topped by a shiny satin blouse of pink or blue; a belt; a felt or straw hat; and a bright woven blanket slung over the back. Often the feet are bare.

The men wear short black pants, shirts, vest-like jackets, and a large woolen poncho. The poncho is woven in one piece with square corners and has a hole in the middle for the head. Suspended from the waist is a pouch containing coca leaves. On the head under a felt hat is a closely-fitting knitted woolen cap with ear

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C. Langdon White, "Storm Clouds Over the Andes," *Scientific Monthly*, Vol. LXX, May 1950, pp. 306-316.

William H. Haas, "The Plateau Indians of South America," Journal of Geography, Vol. 45, September 1946, pp. 243-253.

flaps. On the feet are sandals made from cattle hide or from old automobile tires.

A few whites and many mestizos make up a growing part of the vendors at Huancayo. These are professional tradesmen who are engaged full-time in buying at wholesale and selling at retail. It is not these, however, who give the market its color and fascination.

Among the Indians, the buying and selling are conducted mostly in Quechua, and to some extent (when necessary) in Spanish. When the exchange is wholly between two Indians, it may be a silent exchange, neither buyer nor seller uttering a word. Philip A. Means tells the story well:

> "A few steps farther on, however, I came upon another booth which was altogether antique in appearance. A sturdy Indian woman was offering haunches of llama meat and another was slowly, reluctantly, adding a potato at a time to a pile on the ground.
>
> "Both women were unhurried and serene, all their emotions being concentrated in their faces. The expression of the seller was one of determined avarice, that of the buyer was one of steadily increasing hesitancy.
>
> "I could see that very soon the buyer would reach her limit and would take herself and her potatoes off to some other booth whose mistress had less lordly ideas about the potato value of a haunch of llama.
>
> "I was indeed witnessing an authentic barter trade such as was universal under the Inca Empire."[3]

When the deal is consummated, or when it is called off, both participants withdraw in silence.

Among the Indians, women comprise the great majority of the vendors. As soon as the market gets under way, most of the men retire to the side streets with the donkeys or llamas to chew coca, drink chicha, and visit with their friends.

The women place their various items on the ground on a blanket woven by themselves, dividing their wares. The market is vaguely departmentalized; for example, vendors of potatoes or chuño (shrunken, cork-like, petrified-looking potatoes desiccated by prolonged exposure to the frost of the high country) and onions may congregate at one place, vendors of meat in another, etc. Departmentalization is not adhered to strictly, however, because at some places, one can get quite a mixture of goods. Some vendors specialize on a single item, e.g., coca. Those who have stalls for displaying their goods are mostly mestizos.

The writer noted a great difference in the market during a

[3] Philip Ainsworth Means, "The Incas: Empire Builders of the Andes," *National Geographic Magazine*, February 1938, p. 225.

ten-year interim. Definitely Indian in its character in 1938, the market was rapidly becoming a national market when visited in 1948. Barter is disappearing fast; *soles* are now paid almost wholly for such articles as coca, aniline dyes, fruits, hats and textiles. Of these the principal item exchanged for money is coca, which is chewed constantly by most Andean Indians—both men and women—and which is apparently indispensable. The coca section of the market is usually the busiest part of the market. Handicrafts are disappearing in the face of inferior, shoddy goods manufactured in Lima. Huancayo is thus no longer "out of this world," but is an integral part of Peru's 20th century, and what one sees here possibly augurs well what the future of much of Peru is to become.

Thousands of articles change hands quickly in the mile-long rows of stalls, and in the early afternoon, the day's work being done, the Indians retire to the highways to begin their long, hard journeys homeward. For another week, so far as the Indian is concerned, there is a complete suspension of trade in Huancayo.

A GEOGRAPHY PROJECT FOR UPPER GRADE LEVEL

Hazel Latendress
State Teachers College, Livingston, Alabama

This spring a redecoration program was worked out in our geography classroom which might well be duplicated in the ordinary classroom as a project carried out by higher level students. Weary of facing a blank uninspiring wall during college classes the instructor sought the aid of the Art Department in a plan to modernize the classroom. The resulting mural, a huge simplified Mercator projection of the world, covers the entire wall from ceiling to floor, and the room has become a rather unique geography classroom which actually looks its part.

The initial step was marking the wall off into 2′ squares for a working surface. The snap-string method was used for this task. A piece of string rubbed with chalk was held tautly stretched from top to bottom of the wall and snapped to dust a convenient chalk line the full height of the wall. The same method was used on the horizontal. A small Mercator world projection had already been blocked into an equivalent number of squares and the next step

was to transfer the outline of the continents on the wall block by block. This was done with colored chalk which showed up to advantage on the original cream-colored wall and could easily be brushed from the wall as the actual painting was done. Choice of color was not difficult. A dusty rose was used for land areas and a blue for the seas. The land and water areas were then painted on in their proper areas with ordinary flat wall paint. No attempt to use place names was made, tho such might easily have been done if desired. The result was a modern and decorative mural.

Rose and blue paint were then mixed to produce a soft blue used on two other walls of the room and the third wall was painted a darker blue which harmonized nicely with the mural wall. Walls were treated as flat surfaces, and both wall and woodwork were painted to lighten the room and give a cool and attractive appearance.

No attempt was made for extreme accuracy. Certain areas mentioned frequently in class work, such as the Maracaibo Basin, Cyprus, the Celebes, etc., were exaggerated somewhat in size, so that such places would be obvious to the students and "eye-catching" at casual glance. Most of the Pacific islands could not be shown, nor could coastal detail be expressed. Yet, in spite of inaccuracy, the students do have a map constantly in their presence which tends to familiarize them with the general world pattern while adding to the appearance of the room.

Such a project carried out by students themselves could be made into a valuable educational experience geographically, socially, and artistically. Choice of colors, transferring the map to the wall, and the actual painting process is a highly satisfactory experience for students of upper elementary grades. It is a co-operative and socializing effort in which the children must work as a group. The finished product is a brighter and more attractive classroom with a touch of originality which gives the air of importance and spaciousness so needed in many rooms. The project is an excellent means for place study if well handled, and many a student may, for the first time, realize the actual location of a number of places. The significance of position may be recognized by others when they have the task of painting places in their proper surroundings on the mural. Similar work may be done with, let us say, the economic geography of a particular state, utilizing the usual symbols for various products.

Besides the value derived from a brightened classroom and direct social and educational value to the children carrying out the project, such a map may prove a valuable visual aid to other youngsters who are to use the same classroom later and who will gain map knowledge thru continual exposure to such a mural.

After the project was completed some professional geographers questioned the selection of the Mercator projection. Other projections should be carefully considered before making a selection. The choice of a correct projection may well be made a geography lesson with inquiries sent by a pupil committee to university cartographers asking for information as to what projection should be used.

RECENT CULTURAL CHANGES ON THE ISLAND OF NAURU*

GRAHAM H. LAWTON
University of Washington

The island of Nauru is a small isolated submarine mountain peak of coral formation situated in latitude 0° 32′ south of the equator and longitude 166° 55′ east of Greenwich. The island which has an area of 5,263 acres is oval-shaped approximately 12 miles in circumference and is surrounded with a coral reef which is exposed at low tide. The width of the reef varies from 100 yards to 200 yards, the widest portion being to the north whilst the narrowest skirts Anibare Bay to the east. On the seaward side the reef slopes away at an angle of approximately 45° into the deep water of the Pacific Ocean. In many places along the reef, particularly on the north and east, there are coral pinnacles, standing singly or in clusters, giving a rugged appearance to the coastline.

On the landward side of the reef there is a narrow strip of sandy beach from where the ground rises slightly forming a fertile belt of land ranging in width from 150 yards in some places to 300 yards in others and completely encircling the island. On the inner side of the fertile belt a coral cliff formation rises to a height of from 40 to 100 feet above sea level merging into a central plateau of pronounced undulations, ranging from a saucer shaped depres-

* Presented at the Salt Lake City Meeting of the Association of Pacific Coast Geographers, June, 1950.

sion to the west known as Buada Lagoon, the lowest portion of the plateau, to features rising to a height of over 200 feet above sea level. The plateau contains the phosphate deposits which give the island prominence. It originally consisted of high jagged coral pinnacles which have been concealed by Nature with phosphate. These pinnacles may rise from 30 to 50 feet from the floor of the old coral formation and the removal of the phosphate from among them leaves a rugged wasteland terrain.

CLASH OF EUROPEAN AND NATIVE CULTURES

Nauru provides an interesting illustration of an important geographic concept; that the significance of the physical conditions of the land depends upon the culture, or way of living, of the inhabitants. Different features of the physical environment offer different opportunities to different people. To the indigenous natives most of this island is a barren wasteland; the only part that is suitable for settlement is the narrow coastal belt on the seaward edge of the coral cliffs (see map). Here the coconut grows in abundance, and to the Nauruans this one tree is the most useful on the island. It provides food, drink, clothing, building material and oil. The husk is used for the making of coil ropes. Torches are made out of the dead leaves; the spathes are used for tinder, for making sieves for catching fry on the reef, and for catching fresh water off tree stems. The shells are used for holding water and toddy; the leaves and trunks are used for building material, for basket making, and the making of leaf puzzles; the flesh of the old nuts is useful for making copra and oil; the charcoal formed from the burnt nut is used for painting the face and body for dances and war.[1]

Two other trees on the island are of importance to the natives; the pandanus for its fruit and the tamano which grows in the interior for its use in the construction of canoes.

To the European the central part of the island is a source of great wealth, the phosphate rock which is mined for export overseas. To extract the valuable raw material from the interior of the island the European has to depend on imports of equipment, food, and even labor. Agriculture on the island cannot support many people; the little that has been introduced in recent years is

[1] Camilla H. Wedgwood, "Report on Research Work in Nauru Island, Central Pacific," *Oceania* Vol. VII No. 1, September, 1936.

limited to subsistence crops here and there but on a very small scale. The coastal strip which provides the Nauruan with his coconuts and pandanus fruit, is not able to supply the European with even his bare necessities. In this way, therefore, the island presents an interesting example of a clash of two different cultures, European and native. In the short span of fifty years the one has been superimposed upon the other with the inevitable result that the older and more simple culture has undergone gradual changes. The prediction has been made that the phosphate deposits may last for only another 70 years. The question that will have to be faced sooner or later is whether the Europeanized Nauruans will be able to exist on a coral island which contains no further attraction for the European.

Discovery of Nauru

It was this island that was first discovered by Captain John Fearn of the "Hunter" on a voyage from New Zealand to the China Seas in 1798. He described it as a beautiful little island and in his chronicle written in 1799 there is recorded the fact that he named it "Pleasant Island." Prior to 1888 when the island was proclaimed German territory as part of the Marshall Islands Protectorate, the Nauruans came into contact with Europeans from time to time, especially traders, escaped convicts, and deserters from whaling ships. Some of these men remained only for a short time but others settled down on the island and engaged in trading activities. From these men and from visiting whaling vessels the Nauruans acquired implements, steel tools, guns and ammunition, as well as a taste for alcohol. Ideas spread rapidly thru the island and the native economy underwent social and economic changes that were soon accelerated by the introduction of the Mission stations and the development of the phosphate industry.

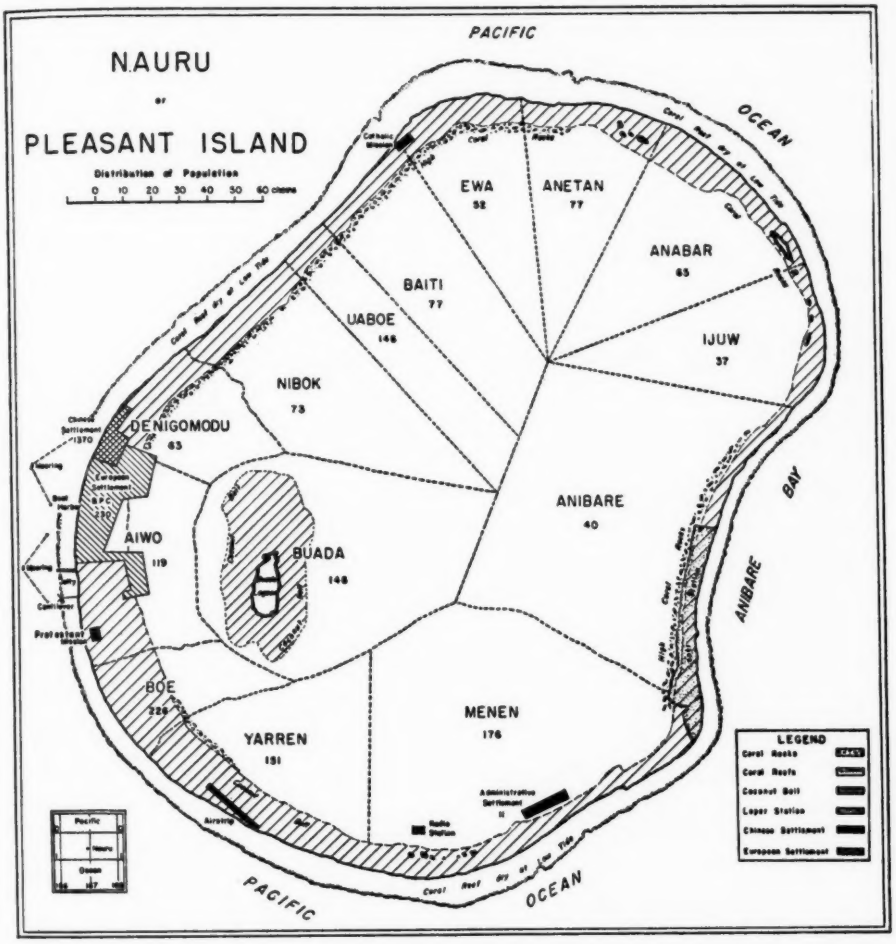
The missionaries were responsible for the early education of the Nauruans. The English language was taught in the schools and the church, and European customs and ideas were gradually introduced in the name of civilization.

The phosphates were discovered in 1900 but they were not worked until 1906. It was thru this natural resource of the island, of little interest and value to the Nauruans, that the island became known to the rest of the world. Its name could have easily been changed from "Pleasant Island" to "Treasure Island." New re-

sources had a new meaning to a new people. The Nauruans were swept along in the swift tide of change.

BRITISH MANDATE AFTER FIRST WORLD WAR

During the first World War the island was occupied by an Australian force and under the Versailles Treaty Germany renounced all her rights and title in respect to Nauru in favor of the



principal Allied and Associated Powers, who agreed that a Mandate for the administration of the island should be conferred on His Britannic Majesty. On the 2nd of July, 1919, the Governments of Great Britain, the Commonwealth of Australia and the Dominion of New Zealand concluded an agreement which provided

that the Administration should be vested in an Administrator. The same agreement provided that the right, title and interest in the phosphate deposits of the island purchased by the Governments of Great Britain, Australia, and New Zealand from the Pacific Phosphate Company should be vested in and worked and sold under the direction, management and control of a board of three Commissioners called the British Phosphate Commissioners, one Commissioner being appointed by each government concerned.

DEVELOPMENT OF PHOSPHATE INDUSTRY

Thru this agreement the island became a "C" Mandate of the League of Nations and as such the resources of the island were not to be exploited but developed for, and with the help of, the Nauruans whose welfare was to be the first consideration of the Mandatory Power. Without this protection the valuable phosphate deposits in the central part of the island could have been developed without any regard to the welfare of the indigenous people. Because the Nauruans were not too interested in working for the Phosphate Commissioners it was necessary to introduce a labor force from China and the South Pacific islands to carry out the physical work of the mining operations.

Chinese were recruited from Hong Kong for a definite period of two years after which time they were permitted to return to China if they so desired. The Chinese were conveyed by sea free of charge to Nauru, were provided with adequate quarters, supply of rations as well as medical and hospital facilities. While legislation does not prohibit immigrant indentured employees from bringing wives and families to the island they are not encouraged to do so owing to unavailability of requisite accommodation. The village life of the Nauruans was not disturbed too much by the mining operations. Some adjustments had to be made to cope with the increased amount of work connected with the administration of the island. At first the Nauruans welcomed the Kanakas and the Chinese because they provided them with a market for any surplus fish that they might have. This brought them into closer contact with a money economy. The more they were employed the more money they had to spend at the European and Mission stores and this with the royalties they received from the Phosphate Commissioners in return for leasing the land inevitably led to an increasing dependence on a non-native source of food.

CHANGES IN NATIVE ECONOMY

It is not difficult to imagine the tremendous changes in the life of the Nauruan village that came as a direct result of the discovery of the phosphate rock. New people brought new equipment, new foods and new ideas. A small part of the island was soon transformed by mechanical equipment exposing the underlying coral pinnacles. New houses and buildings were constructed. Ships anchored off shore to supply all the wants of a new people. The native had less inclination to climb the coconut tree or to set traps between the breaks in the coral reef to catch the fish. He was given

TABLE I.[2] POPULATION

The following table shows the variations in the Territory's Population during the last ten years.

Year	Chinese	Europeans	Other Pacific Islanders	Total Immigrants	Indigenous	Total
1938	1,533	179	27	1,739	1,661	3,400
1939	1,512	171	44	1,727	1,733	3,460
1940	1,350	192	49	1,591	1,761	3,352
1941	584	68	193	845	1,827	2,672
1942	194†	7*	193†	394	1,848*	2,242
1943	Japanese Occupation Period 8.23.42 to 9.13.45					
1944	—	—	—	—	—	—
1945	‡	‡	17	—	589	2,247
1946	778	79	21	878	1,369	2,247
1947	1,163	192	31	1,386	1,379	2,765
1948	1,370	247	97	1,714	1,448	3,162

* Population at the date of the Japanese occupation 23rd August 1942.
† Estimated population at the date of the Japanese occupation 23rd August 1942.
‡ Apart from other Pacific Islanders and Nauruans, reliable figures are not available for this period.

a job to do, at first mainly administrative, for which he was paid a wage; this gave him the opportunity to exchange his earnings for European goods, food, clothing and new commodities.

The small size of the island, less than 9 square miles, and the fact that the total Nauruan population was never more than 1900 (see Table I), are the major reasons why the new ideas spread so rapidly and why the change in the native way of life was so effective in such a short time. The modern young Nauruan is a good imitator, a person without roots, and with but little sense

[2] Tables I and II and map data from "Report to the General Assembly of the United Nations on the Administration of the Territory of Nauru from July 1st, 1947, to 30 June 1948," published in Australia, 1949.

of social responsibility. He has asummed that European customs are superior to Nauruan customs simply because they are European and he has become contemptuous of the middle-aged and elderly people because of their interest in preserving the traditional customs, and native ways of living. There remains the task of linking the past with the present; of restoring that personal dignity and self respecting mode of life for which the peoples of Central and Eastern Pacific have long been noted while at the same time enabling the islanders to reap benefits from the complex European civilization with which they have been brought into contact. To this end Nauruans are being trained in medicine at the medical school at Suva, Fiji, while others are sent to Australia for a technical and professional training.

Second World War

The recent War in the Pacific tended to accelerate the changes that were already beginning to revolutionize the social and economic life of the indigenous people. The importance of the island to the food producing Dominions of Australia and New Zealand was recognized by Germany in the early years of the war. In December of 1940 a German raider shelled the island damaging port and island installations after sinking five phosphate ships. After Pearl Harbor Japanese planes bombed the island continually. Europeans and Chinese were evacuated in February 1942. In August of the same year Japanese forces occupied the island, demolished the installations and used much of the mechanical equipment for barricades and coastal defenses. The administrator and four European companions were murdered, and more than 1,200 Nauruans were removed to Truk Atoll in the Carolines group. The island thus became a Japanese fortress not because of its strategic location in the Pacific, but because of its economic importance to the Allies.

On September 13, 1945, the Japanese forces numbering 3,735 surrendered to the Australian Imperial Forces. The Nauruan population which stood at 1,848 at the time of the invasion had been reduced by malnutrition, starvation, disease and war atrocities to 1,278 when the Australians returned. They had been an enslaved people and all their social, political, economic, and educational advances had not only come to a stop but the suffering and the damage of five years of war had brought new problems. Possession of a strategic raw material, developed over a period of forty years,

had made them the very first target in the Pacific in World War II. Along with many other native peoples of the Pacific Ocean the Nauruans suffered in a war which had no meaning to them.

TABLE II.[3] OCCUPATIONAL DISTRIBUTION OF POPULATION AT 30TH JUNE, 1948, NAURU

(1) Non-native Population

Employment	Europeans			Chinese		
	Adults		Children	Adults		Children
	Males	Females		Males	Females	
Employed by—						
Administration	8	5	2	16	—	—
British Phosphate Commissioners	123	57	46	1,351	1	2
Missions	2	1	3	—	—	—
Total	133	63	51	1,367	1	2

Summary—	Men	Women	Children	Total
Europeans	133	63	51	247
Chinese	1,367	1	2	1,370
	1,500	64	53	1,617

Note.—With few exceptions women and children are dependents of employed males.

(2) Indigenous Population

Indigenous Population at 30th June, 1948		1,448
Less women, children and boys under sixteen years		1,037
Male population over sixteen years		411
Less—		
Inmates of leper station	3	
Invalids and senile	9	
*Unemployed	35	
	—	
		47
Male population in employment at 30th June, 1948		364
Subdivision of employees as follows—		
Employed by Administration	209	
Employed by British Phosphate Commissioners	116	
Employed by Nauru Co-operative Society	39	
	—	
		364

* Unemployed for personal reasons. However, several operate as private fisherman and fruiters.

The five years of war brought destruction to the island; coconut trees were destroyed; installations became defense works. The program of rehabilitation and reconstruction in the last few years has given many Nauruans many opportunities of employment. Of the 411 male Nauruans over 16 years of age in June 1948, 209 were employed by the Administration. Another 116 were employed by

[3] Ibid.

the British Phosphate Commissioners (See Table II). An even closer link was in this way forged with the European way of living.

This shipment of phosphate which had of necessity stopped during the war years was resumed on July 30, 1946; new royalty payments became effective a year later. The Nauruans received 13d per ton instead of 8d, which gave them more purchasing power for the consumers goods in the European stores. This increase may well be the death blow to any further dependence upon the old methods of obtaining food. New ideas brought with them new demands and the native economy which had been so closely related to the immedate environment is now more dependent upon the supplies that are brought to the island by ships from Australia, New Zealand and China.

The Future for the Nauruans

What of the future? The island is now under the United Nations International Trusteeship system with the governments of Australia, New Zealand and the United Kingdom as supervisory powers.

In April of this year a United Nations Commission was sent to the Souhtwest Pacific to investigate the political, social, economic and educational problems of the Trusteeship territories. Already much has been done to provide the Nauruans with medical and educational facilities and more and more are they being given the opportunity to work out their own problems thru their native councils and village meetings. One of their greatest problems, however, has been inflicted upon them. The impact of the western world came because of one resource; once that resource has been used up, which at the present rate of consumption may come within the next 70 years, what is to happen to the Nauruans? Will they be content to return to their fishing traps and their coconut trees? If the island cannot provide them with the opportunity to live the life to which they have been brought by influences from without, it surely is the task of those who are responsible for the transformation of the native economy to see that they are not deserted in a time of need. We have brought them new ideas; it may be necessary now to think about providing them with a new land.

INTERMEDIATE GEOGRAPHY: A READING PROBLEM

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Intermediate geography teaching is largely a reading problem. The children are trained in the primary grades to read stories. They have had very little practice in reading factual material. Usually the child meets geography in a book for the first time in the fourth grade. The vocabulary of most geography texts goes beyond the knowledge of most of the children in this grade. Many teachers do not understand the problem involved in reading the content material found in geography. The idea persists that if the child can read a story he can read any kind of material. This is far from the case, for the thread of a plot will carry him thru the story to find out what happens, or how the story turns out. That same thread is not found in a geography text.

Obviously then one of the first things to do in the intermediate grades is to teach the child to read factual material. They must be taught or they will never be able to get from the text what they should get. Progress may be very slow for several weeks at the beginning of the year, but the time can be made up later, and the teacher will reap the reward for her painstaking care in laying the foundation for the intelligent reading of geography.

INADEQUATE ASSIGNMENTS

In the regular reading class (or at least in the class where we are using a basic reading text) the teacher tries to motivate the reading of the story so that the child will want to read to see what goes on, but no such care is taken in the majority of geography classes. The assignment too often consists of so many paragraphs or pages, and the child is expected to read the lesson and learn the important facts. Why should he want to learn this material? Have you ever tried to follow a lecture or read an article on some subject with which you have had no previous knowledge, training, or vocabulary? How much did you get out of it? The child entering the fifth grade is in much the same condition so far as his knowledge, training, and vocabulary in geography are concerned. Sometimes it seems that all he has gotten from previous work has been an active dislike for the whole subject. Teachers must recognize

the fact that the child is facing a whole mass of subject matter much of which is totally unfamiliar to him. Geography reading can be motivated, too. Suppose the class is ready to study New York City. Some child will know that New York is our largest city, then the teacher can ask this question, "Why do you suppose New York has become such a large city?" Most of the children will be curious enough to find some of the reasons for its growth. Often the children themselves will raise the motivating question or questions, and it is always better for them to do so.

To understand geography the child must first understand its vocabulary. This vocabulary must be taught. You cannot leave to chance the acquiring of the needed words to make the subject meaningful to the pupil. In the following paragraphs I shall use only a few of the words found in intermediate geography texts. My teaching has all been in small towns or rural communities where all children are familiar with the activities of the farm and country.

VOCABULARY DIFFICULTIES

In the first sentence of an intermediate text in geography, this expression, "Boston, the industrial center of New England," is found. To the children of Chicago or New York this term could easily be explained, but the children of the Middle West farming area would not have a very clear idea as to what an industrial center would be. Here is the place to teach them the meaning of the term "industrial center," taking them back to the root word "industry" to clarify the meaning of "industrial." When they understand the term as applied to Boston it will be necessary to suggest that other cities such as Chicago and New York are also industrial centers. In my class I would use Indianapolis as an example of an industrial city, because most of the children are familiar with the types of work which are done in Indianapolis. On the other hand the terms "rotation of crops" and "mixed farming" are known to the children in the rural section of our country, but to the children of the large industrial centers they would have about as much meaning as Greek does to the average adult. These terms must be made meaningful to them, and each teacher will have to use her own method of clarifying all terms to her class. Magazines and travel folders furnish a wealth of visual aids to help her make vivid explanations of the words found in the text.

Again the words "river system," "island," "delta," "river

basin,'' are usually just so many words on the page to the child. If you are fortunate enough to have even a small creek near the school building, take the children to it and show them examples of an island, a delta, a river system, and a river basin. When they go back to the text these words will mean something to them. They can visualize what a river system is for they have seen one on a small scale, and it is not long until you will be getting this reaction from the child, ''The Mississippi River system is just like our little creek only it is a lot bigger.''

Sometimes familiar words are used in geography in an entirely different manner from the way in which they are ordinarily used. For example, the word ''combine'' will be known to many fifth graders, but when they meet the word in geography where it talks about a ''combine'' in connection with the harvesting of wheat, you may get a surprise when you ask them what a ''combine'' is. The children of a farming region will tell you what it is, what it does, and the best kind of ''combine,'' and they will produce any number of reasons for buying that particular machine. However, the urban child will have no such background of understanding. This understanding will have to be built in class.

Many terms will have to be explained by the teacher. Often a rough drawing on the blackboard makes clear to the child what could not be explained in many words. In explaining ''divide'' or ''watershed'' a sketch of a roof will lead the pupil to see that the water flows both ways down the sides of the roof. The same procedure can be used with a hill, finally leading the class to see that rivers flow both ways from the point of highest ground. Always apply the correct name when talking about things in geography.

Preparation on the part of the teacher for each lesson is necessary if the child is to build a geography vocabulary that will enable him to read his text with understanding and interest. Many times we have only to step outside the schoolhouse door to find an excellent example of the very thing we are trying to teach the child. When we utilize the things at hand geography becomes a part of the child's daily living and not something learned from a book about a place miles from him.

Children muddle thru intermediate geography with a meager idea of what it is all about. Often geography is presented in such a way that they have no idea that it has anything to do with the way in which they live. The foundation for interest in and under-

standing of geography should be laid in the intermediate grades. The foundation in any subject is largely determined by a clear knowledge of the vocabulary for that subject, and geography is no exception. A thoro understanding of the geography of the world would help solve many knotty problems confronting us to-day. However people are not going to do too much studying of geography if they get nothing but a distaste for the subject in the intermediate grades.

THE GEOPOLITICS OF THE ALEUTIANS

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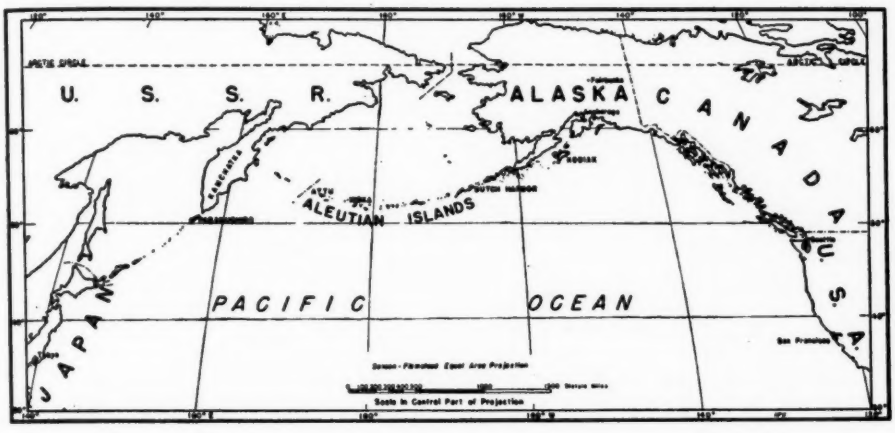
The strategic location of the Aleutians (lying at the northern apex of what has been called the strategic triangle of the Pacific—Panama Canal to Hawaii to Attu Island) had by the end of the summer of 1950 again become more clearly recognized due to the invasion of Southern Korea (see map). Before World War II began, Americans had only a vague knowledge of the Aleutians, or even of the Territory of Alaska. Not until the Japanese struck at Dutch Harbor on June 3, 1942, and took and held Kiska, Attu and Agattu Islands, did the American people generally awake to the realization of what the seizure of these islands might mean militarily. Then everyone was startled by the news that the Japanese were in the Aleutians, occupying a portion of America's territory.

The Japanese had planned for years to capture these islands and Washington blithely helped them.[1] They sounded every vital cove and channel; they erected markers to guide their ships. They investigated the native food supply, testing sea and land plants for edibility. Indeed, the Japanese knew (or even now know) much more about the Aleutians than we do. The Japanese realized the importance of the Aleutians already in 1922, when at their insistence the United States agreed in the Treaty of Naval Limitations not to build forts or station military forces there. Unfortunately, after the Japanese denounced that treaty, the United States still did not establish strong military forces and fortifications in these islands.

[1] Corey Ford, *Short Cut to Tokyo,* Charles Scribners' Sons, New York, 1943.

Back in the Thirties they organized a fake Tokyo-to-Washington flight for no other purpose than to land spies on the islands as "weather observers" and then called off the flight, which they never had intended to make anyway. In later years they invaded American fishing grounds and when, after vain appeals to Washington, American fishermen opened fire on them as poachers Washington humbly apologized to Tokyo.

America's whole handling of the Aleutian situation, before and after World War II started, seems to have been inept and at times childlike. When the Japanese planted themselves on the western



islands and dug in, some Washington wits twitted America's Army fliers and naval fighters about the "one-way weather," that was supposed to be a military and naval alibi for failure to recapture the positions. But this weather—which the Japanese seemed to have spent years in studying, while we were nice to them and not studying it—really is "one way" and that was all in the invaders' favor.

In the Aleutians, storm fronts always move from west to east. The Japanese took advantage of a storm to get in supplies; they knew just how long the storm would take to pass over America's bases to the eastward and consequently how long it would be before they could strike again. When the weather broke they simply pulled in their necks until American bombers went over and then utilized the next ten days of fog to rebuild their installations and ready themselves for the next attack.

"Who holds Attu holds the weather for tomorrow," states Corey Ford. Some of the islands in the Aleutians were the only American territory in North America occupied by any one of the axis powers. Actually, the Japanese, by their landings on Kiska and Attu during World War II, created one of the most successful diversions in the history of warfare. The United States had to concentrate some 100,000 men in Alaska—most of them in the Kodiak-Dutch Harbor-Aleutian area, where numerous airfields were built.

GEOGRAPHY

The Aleutian Islands are a chain of five main sets of volcanic islands rising out of the North Pacific between Alaska and Siberia.[2] There, among fogs and sudden storms, volcanoes blow rings of steam; islets pop out of the water and then mysteriously disappear again; and earthquakes make and unmake harbors, cliffs, beaches and caves.

The islands are an archipelago extending westward from the extremity of the Alaska peninsula, and forming a part of the Territory of Alaska.

The islands, having an over-all length from east to west of 11 hundred miles and an area approximately of 4 million acres, lie well within the north temperate zone. Hence the "Aleutians are among the most climatically seductive places in the world."[3]

The Aleutians comprise five main groups: Near Islands (Attu, Agattu, and the Semichis), Rat Islands (Amchitka, Semispochnoi, Kiska, Little Sitkin, Rat, Chugul, Davidof, and Khwostof), Andreanof Islands (Atka, Amlia, Great Sitkin, Adak, Kanaga, Tanaga, etc.), Islands of Four Mountains (Chuginadak, Herbert, Carlisle, Kagamil, and Uliaga), and Fox Islands (Unimak, Unalaska, Umnak, and the islands of the Krenitzen group—Ugamak, Tigalda, Avatanak, Rootok, Akun, and Akutan). They cover an area of 6,821 square miles, and have a population of 1,300 (in 1939).[4]

The mysterious island chain has been a bloody bridge between

[2] For a valuable set of photographs of the area, see: "The Aleutians," *Life*, XVI, 11, March 13, 1944, pp. 71-88.

[3] Anthony J. Dimond, "The Aleutians," chapter 17, pp. 266-272, in Hans W. Weigert, & Vilhjalmur Stefansson, Eds., *Compass of the World*. The Macmillan Co., New York, 1944.

[4] The Komandorskie group, at the western tip of the chain off Kamchatka, belongs to the U.S.S.R.

two continents, probably for untold centuries. It lies well within the north temperate zone, between 51°-54° north latitude. Here the Kuroshi (or Japan current), plays a rôle similar to that of the Gulf Stream to the British Isles—both areas being famous for fogs. The southernmost limit of the Aleutians is not more than 150 miles north of the boundary between the United States and Canada. Consequently the location of the Aleutians cannot be considered as lying in the Arctic—a misconception held by many people including some geographers.

THE WEATHER

Of all United States outposts the Aleutians are probably the wildest and most inhospitable. There are almost no trees on the islands. There are few animals. In the summer the valleys are covered by waving grasslands which look like good pastures but they are not. In the valleys there are many small flowers like buttercups, larkspurs, violets and anemones.

The temperature seldom drops below freezing in winter or goes above 50° in summer. The islands are enveloped in almost perpetual fog. Sometimes there are as many as 250 rainy days in a year and as few as eight clear days. Flying is always dangerous and navigation of ships thru the narrow rocky channels of the Aleutians is a task for skilled hands only.

But fog is not the only weather problem in the Aleutians. There are sleet storms and sudden squalls and freezing clouds that load the wings of a bomber with a ton of ice in less than a minute. There are "williwaws" that can drop a plane 3,000 feet in a few seconds, and there is water so cold that a flier cannot survive in it for more than 20 minutes. The aerologists explain these weather conditions by the presence in winter of polar air over a warm ocean, and in summer of warm air over a colder ocean. Such conditions make for storms in the winter and fogs in the summer. The only time, in fact, when good weather may be expected is in the brief weather transition periods of spring and fall. When good weather does come, it is known as "senatorial weather."[5]

The islands have few good harbors, and ships passing along the

[5] The story goes that in the early days of the war, just after the Japanese landed on Attu and Kiska, a Senate investigation committee arrived at Dutch Harbor; they flew in by plane on the only clear day in many weeks, stayed an hour, then departed again for the States, still in perfect sunshine. Back in Washington they assured reporters that all the talk about the bad weather in the Aleutians was nonsense.

shores must be alert for shoals, treacherous tide rips, and whirlpools. Kiska is the best harbor in this chain.

History

The Aleutians have always been a link between two worlds. Over this land bridge in ancient times probably came the American Indians, the Aztecs of Mexico and the Incas of Peru. They were probably discovered by Europeans in the 17th century when the Dutch and the Portuguese landed there. On the rocky beaches and foggy mountains were found thousands of fierce natives who lived by hunting whales, seals, foxes and sea otters. Most unusual custom of these Aleuts, who were anthropolitically related to Eskimos, was their habit of mummifying their dead and seating the bodies in hidden caverns.

In 1741 the Aleutians were rediscovered by the Russian expedition of Commander Vitis Bering. Altho the commander died of scurvy and one of his two ships was wrecked, the expedition managed to get home with a valuable collection of furs. That was the beginning of the end for the Aleuts. The Russian fur traders, and later the American, descended on the islands, trading with the natives when they could, looting and killing when they could not. Not even the purchase of Alaska by the United States in 1867 helped Aleuts. In 1911 an international treaty, signed by the United States, Great Britain, Russia and Japan, ended the slaughter. But it was too late. Aleuts, like the sea otter, are almost extinct (only some 5,000 have been left), they live by fishing, hunting, and fur raising. Among them are a few American traders, teachers, missionaries, and sheep ranchers—in addition to American Army and Navy men.

The Strategic Aspects

The geopolitical importance of the Aleutians in world strategy is proved by the irrefutable facts of geography. Since the islands front on the Pacific ocean, they are of the highest consequence in all military plans of the nations. This is because the direct and short route—the Great Circle route—between the western coast of the United States and Japan lies directly thru the Aleutian Islands.

No one can really grasp this by looking at any map in which some portion of the area thereon is always distorted. The distortion is greatest for northern countries on the type of map called

Mercator's projection, which envisions the earth as a cylinder, not as a globe.

A single glance at the North Pacific area on a globe will show that the high road between Northwestern United States and the Japanese cities of Tokyo and Yokohama, by sea and by air, goes directly thru the Aleutians. To seek instead an approach to Tokyo thru the Hawaiian islands involves a journey 1,400 miles longer than that which is covered by the Aleutian high seas and air road. In the Aleutians the United States lies closest to Japan. The distance between Attu Island and Paramoshiri Island, site of a great Japanese naval and air base, in the northern end of the Japanese Archipelago, is 716 statute miles. With the Korean danger, and the push of Soviet Russia toward Asia's shores, it is evident that the United States needs to control the area, or protect it from being controlled by the Soviets. Whoever controls the Aleutians has a flanking position on the whole Pacific Ocean.

The geopolitical implications of the invasion of the Aleutians by the Japanese forced the United States to start building its military and naval bases there. In June, 1942, the Japanese seized Attu and Kiska and remained a constant threat to Alaska, Canada and the United States until August 1943 when they were finally driven off. The navy built a base at Dutch Harbor, on tiny Amaknak Island, off the shore of Unalaska. A mile and three-quarters long, this harbor is almost landlocked. Around it rise jagged mountains which sometimes cause "williwaws" (sudden gusts of cold land air). Within two years Dutch Harbor was transformed from a fishing village into a mighty Navy base. An air base was built on the Andreanof Island, within 2,300 air miles of Dutch Harbor to supplement it.

After World War II, the Aleutians, and such other outlying points as Nome, have been stripped almost entirely of any real defensive forces. From the point of view of America's post-war strategy, the Anchorage-Fairbanks area became important. Here American air strips among the largest strips in the world, are located at the Elmendorff Air Force Base (Anchorage), and Ladd Air Force Base (Fairbanks). However, the Aleutians are still recognized as important to the Navy, particularly in submarine and anti-submarine war.

MERCATOR GRID: ITS PRACTICAL AND PEDAGOGIC MERITS

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The geographer in his efforts to delineate the characteristic personalities of regions of the world uses an array of symbolic devices matched by few other scientists. These include such common stand-ins for reality as written structures, statistics, graphs, mathematical formulae, sketches, cross-sections, photographs, globes, maps. In the geographer's work elaborate instrumentation basic to many of above symbols further separates understanding from reality.

With little doubt the most useful tool of the geographer is a map. And fundamental to its symbolic detail is the framework of the map—the lines of latitude and longitude so orderly arranged on a plane as to satisfy certain specifications. Of long past, of present, and of future *vital* concern are maps specifically designed to facilitate precise movement over the earth's surface. The best framework for such maps is the Mercator grid.[1]

For nearly four hundred years, since invention in 1569 by Gerardus Mercator, it has been in the service of marine navigators and it is becoming more and more widely used in flying. But despite this record, the Mercator grid has come upon evil days in America's schoolrooms. Here many geographers and especially teachers of the social sciences are on the verge of throwing Mercator maps in the waste basket. This is an unfortunate plight indeed for something that has had such an illustrious history.

In depreciating the Mercator, principal criticisms generally are: 1. this grid exaggerates the size of areal units in high latitudes relative to those in low latitudes, 2. scale calculation is cumbersome, and 3. the poles cannot be shown. Altho these criticisms are true are they sufficient to negate all the good properties of the Mercator? Let us first examine its practical merits, then the advantages of its use in the classroom.

Practical utilities of the Mercator are: 1. straight lines on the Mercator are rhumb lines—lines of constant direction, and 2. shapes of small features are correctly shown. A rhumb line defines

[1] J. Q. Stewart and N. L. Pierce, *Marine and Air Navigation*, Ginn and Co., New York, 1944, pp. 21, 41.

the innumerable points of latitude and longitude a ship will traverse if the line direction is attained. Much navigation is done by recognition of landmarks—bays, headlands, islands, lakes, mountain ranges; there is obvious utility in a map that shows these accurately enough that they may be readily identified with their real counterparts.

In the classroom the Mercator grid represents important subject matter both in itself and for significant concepts that it may be used to illustrate. The following is restricted to brief examination of the Mercator in contexts of 1. philosophy, 2. geography and cartography, 3. mathematics, and 4. social science.

Many philosophers, among them Whitehead, Dewey, and Russell, have recognized for a long time the great role of symbolism in human life; that extensive use of symbols—language, pictures, rites, music, mathematical formulae—probably is the principal factor that distinguishes us from animals. Much of the symbolism that we need for thinking and which stands between us and reality does not come easily. As Susanne K. Langer says in her *Philosophy in a New Key:*

> The world of physics is essentially the real world construed by mathematical abstractions, and the world of sense is the real world construed by the abstractions which the sense-organs immediately furnish. . . . Geometric projection is the best instance of a perfectly faithful representation which, without knowledge of some logical rule, appears to be a misrepresentation. A child looking at a map of the world in Mercator projection cannot help believing that Greenland is larger than Australia; he simply *finds* it larger. The projection employed is not the usual principle of copying which we use in all visual comparisons or translations, and his training in the usual rule makes him unable to "see" by the new one. It takes sophistication to "see" the relative sizes of Greenland and Australia on a Mercator map. Yet a mind educated to appreciate the projected image brings the eye's habit with it. After a while, we genuinely "see" the thing as we apprehend it.[2]

These observations regarding the Mercator can be extended to map interpretation generally: a high order of "sophistication" is needed before marks on a map evoke in the beholder a stimulating sense of landscape reality.

In geography and cartography classes Mercator is an excellent lead-off for map framework study. Here, even though the usual approach involves little or no mathematics, many fundamental notions can be established. Some of these are:

[2] Reprinted by permission of the publishers from Susanne K. Langer's *Philosophy in a New Key*—A Study in the Symbolism of Reason, Rite and Art, Harvard University Press, Cambridge, Mass., 1942, pp. 91-92, 79-80.

1. A spherical (or spheroid) surface cannot be changed to a plane surface without stretch, shrink, or tear; the tennis ball or orange peel analogy makes clear the impossibility of perfect transformation of a spherical to a plane surface.

2. Attention should be called to the fact that the commonly used word *projection* as often applied is a misnomer. Many map grids may be constructed by shadow casting and methods of descriptive geometry and are thus true projections; but probably the majority of most useful grids are purely mathematical constructions. Mercator is in this second group.

3. Comon sense should be employed in grid analysis. In trying to determine the way a grid symbolizes real lines of latitude and longitude comparison should be made with a globe. Often even cursory examination in this manner reveals whether or not the grid is equal area, conformal (correct shape symbolization), good for navigation, or compromises a number of properties. For example, comparison of a small quadrilateral on the Mercator with its mate on the globe reveals the great likeness in *shape*, thus giving Marcator high rank as a conformal grid.

4. The most valuable property of the Mercator—that straight lines are lines of constant direction of rhumb lines—cannot be understood unless definition is given to the term *direction*. Direction is a mathematical concept. The direction of a path is the *angle* measured clockwise from due north of point of origin to that path. The magnetic compass is of course the most commonly used instrument to determine direction, but for our purposes let us assume that the location of geographical poles and magnetic polar areas are the same; the procedures used to shift from true directions to compass directions, and *vice versa*, are relatively easy. Let us further assume that the lines of latitude and longitude are visible on the actual earth. Now on the actual earth let us take a sight on some distant object—a church steeple or radio tower. Does that sighted line have constant direction—does it intersect each successive meridian at the same angle? Not unless you happened to be sighting along a meridian or along the equator. All other lines of sight would *not* have constant direction; they could however be defined in terms of bearings or azimuths—the initial angle at point of origin. An attempt to successfully guide yourself along one of these lines would be virtually impossible because of its constantly changing directions. If you were to follow the bearing, the initial angle of sighted line, you would immediately leave the line and

spiral around the earth toward the pole. *A sighted line and a path that we can follow accurately and precisely based on a constant angle of meridional intersection are two different things.* But how can we determine which one angle (or direction) will get us from one place to another? The Mercator solves this by use only of a straightedge line from point or origin to destination; the straightedge line has but one direction and in addition indicates all the intermediate points thru which passage is made. The Mercator grid is similar to the real earth grid in that latitude lines are parallel and intersect longitude lines at right angles; however, in contrast to converging meridians of reality, the grid meridians are arranged as parallel lines. Thus, from elementary geometry, a transversal (navigator's straightedge line) cutting parallel lines makes equal corresponding angles—the direction of line is constant. Altho rhumb lines, with the exception of north-south and equator routes, are *not* the shortest distances between points, it is only on extremely long east-west travel outside of the tropics that any substantial savings can be made. For example, on a flight from New York to San Francisco the shortest distance route (great circle arc) is only about thirty miles shorter than the fixed direction (rhumb line) route.[3] Consequently for most everyday navigation of a hundred or a few hundred miles the Mercator is used directly and by itself.

At risk of being disloyal to geography, I believe that for any satisfying appreciation of the Mercator one must turn to the queen of sciences, mathematics. As we have seen, the mathematics of straightedge rhumb line is based on a theorem from high school geometry—if parallel lines are cut by a transversal corresponding angles are equal. The mathematics of conformality is more difficult to explain but rests fundamentally on elementary trigonometric functions.[4] However to construct the Mercator rapidly and accurately methods of calculus are used.

Finally a comment on Mercator in social science. Just as statistics may lie if improperly manipulated, so maps naively interpreted can tell great falsehoods. In social science the Mercator, instead of being an object of scorn, can be used for a wide range of purposes provided the peculiarities of its symbolism are understood by the students. On a world scale, one wonders whether at

[3] Stewart and Pierce, *op. cit.*, p. 226.

[4] C. L Vinge, "Mercator Projection: Its Basis in Elementary Mathematics," *School Science and Mathematics*, May 1950, pp. 394-401.

least part of the free people's fear and uneasiness of the Communist colossus is based on widespread ignorance of Mercator Eurasian symbolism.

REALISM IN TEACHING ECONOMIC GEOGRAPHY*

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"Scratch an economic geographer, and you will find a realist" is by no means a universal verity. In particular, we who teach economic geography frequently fail to give adequate attention to the non-environmental factors, which so often are the decisive factors affecting the economic activities of man. Perhaps it is no exaggeration to say that geographers have been so noisy about Nature's silent and persistent influence over man that the non-environmental factor in the equation of human development has been overlooked.

All of us thrill at the task of teaching a dynamic science, every aspect of which is subject to change. Time and time again we point out the significant relationships that exist between man and his environment. We indicate how man adjusts himself to his environment in his efforts to make a living. Also, we show how man adapts his environment the better to meet his needs.

In some areas, particularly in primitive societies, man's adjustments to his environment are simple and direct. The economic life of the Greenland Eskimo, the African Pygmy, and the Khirghiz nomad can be described and explained with ease. There is little, however, about modern society that is simple or direct. In many areas man's economic adjustments to environment are complex and indirect. Furthermore, man's adjustments are influenced by non-environmental factors: law, religion, race, tradition, technology, etc. If we are to be realistic in our teaching, these factors cannot be ignored.

What do such factors as law and religion have to do with economic geography? A few simple examples may illustrate the point. One New Deal law, implementing a new social objective, created the TVA and gave the Tennessee Valley erosion control, flood control, a 9-foot channel for navigation, an abundant supply of cheap

*A condensation of a paper presented at the spring meeting of the Virginia Geographical Society, 1948.

electricity, more manufacturing, and a healthier farm economy in a single decade. Again, no discussion of the petroleum industry is complete without reference to faulty oil law which puts a great premium upon haste and waste, the law of capture which permits a landowner to drain the oil from under his neighbor's land.

In India religion and tradition have long retarded the development of potential resources. Geographers will watch production and export statistics to see the economic effects of the politico-religious division of the unhappy subcontinent into India and Pakistan. There are serious economic consequences of the Hindu belief that the slaughter of an animal may involve the murder of somebody's reincarnated great-grandmother. Prior to the war the depredations of rats cost more than the British Army in India, while the cost of maintaining defective and aged cattle was four times the public revenue from land. Vast economic waste lies at the door of the sacred cow!

Whenever the geographer studies a region or industry, he is soon confronted with the problem of appraising the resources available to man.[1] Fundamentally, resources are merely the environment functioning in the service of man. Unfortunately, the geographer is not always careful to differentiate actual and potential resources. Fertile soil in an unpopulated area, petroleum 30,000 feet under the ground, Labradorean waterfalls, and atomic energy for general industrial use are not resources at the present time. To be a resource, environment must actually function in the service of man.

All of us know that in our daily classroom discussions the $64 question is *why*. Let us beware of explanations that give one cause, only one reason why. Sometimes the geographer succumbs to the temptation of a single-cause explanation, or he greatly overemphasizes this environmental factor or that. Indeed, he is too often afflicted with "climatitis," which may be an occupational disease.

To the discerning student, any course or textbook in economic geography that continuously drools with climatic influence is deadly and unreal. From earliest times climate has had a profound effect upon human achievement, and it continues to play a decisive role in polar areas, deserts, jungles, and some high plateaus. On the other hand, let us realize that human progress depends upon the

[1] For a functional appraisal of the availability of agricultural and industrial resources, see Erich W. Zimmermann, *World Resources and Industries*, Harper & Brothers Publishers, New York, 1933.

nature and extent of man's available supply of energy, or capacity to do work. Any explanation of the dominance of the North Atlantic civilization in the world of today is unrealistic without recognizing the importance of the power-driven machine and the hegemony of coal and iron.

In considering specific industries, we should never forget that while climate may determine potentialities, man makes the decision. Thus, rubber trees can be grown in large areas within the rainy tropics, but 97 per cent of the world's natural rubber is produced in one small corner of southeastern Asia where cheap contract labor abounds. Again, any discussion of the beet-sugar industry that takes no account of tariffs and subsidies is utterly unreal. In appraising the resources available to man, let us give climate its just due but no more.

Dynamics of Resource Appraisal

It is scarcely necessary to point out that resource appraisal involves a study not only of natural environment but of cultural environment as well. Man, the great geomorphologic agent, is both a builder and a destroyer. Every day man performs some new plastic surgery upon Nature's face. When man builds a town, a canal, a railroad, a dam, or an irrigation ditch, this in turn becomes a part of the environment, and man adjusts his economic life to the new situation. With the increasing intermingling of physical and cultural landscapes, geography becomes more complex.

Whether environment will function and how it will function in the service of man depends upon human wants and human abilities. Nothing can be considered a resource if it is not wanted. It is impossible to explain a resource without understanding its usefulness to man. The economic geographer must understand the forces underlying not only supply but also demand.

Patently, human wants vary greatly from time to time and from place to place. The Greenland Eskimo, the South Sea Islander, the Detroit factory worker, the Arkansas sharecropper, and the Wall Street broker have vastly different individual wants. Furthermore, man, his wants, and his economic activity must be studied in evolution. The geographer deals with both time and place.

Individual human wants are important, but man does not live like a hermit or lone wolf. Man for ages has lived as a member of a community or group. Environment must satisfy more than individual wants. It must permit continuous group life and pro-

mote the long-run good of the group. The village, the state, and the nation live on! Group wants, or social objectives, obviously vary from time to time and from place to place. They are a major factor in resource appraisal today. Environment functioning in the service of man in modern Soviet Russia is quite different from that of Russia under the Czar!

In appraising the usefulness of environment, the geographer is compelled to consider the state of the technological arts. Many a potential resource remains potential until man's growing technical skill and knowledge make it available for human use. Niagara Falls was little more than a scenic wonder until the invention of the turbine. The perfection and widespread use of the selective froth flotation process doubled the world's zinc reserves in a very short time. Greater scientific knowledge has given us inexhaustible supplies of magnesium from sea water and nitrogen from air.

With increasing agricultural skill, man pushes back the frontiers of Nature. He invades cooler climates with short-season crops. He plants drought-resistant crops and practices dry farming in semiarid lands. He drains wet soil, fertilizes poor soil, and he creates level land by terracing the slopes of mountains and hills. In this age of modern science, man is never satisfied with what Nature has to offer. He imitates Nature, improves upon her works, and coaxes her to yield more and more. Obviously, the study of Nature's resources and of human resourcefulness must go hand in hand.

Furthermore, thru long and tedious trial and error, man also has acquired new abilities in regulating and improving human relationships. These abilities are called institutional arts. Education functioning thru schools, government functioning thru legislatures, courts, and international organizations, and business operating thru cartels, corporations, labor unions, and farmers' cooperatives illustrate institutional arts in the service of man.

Both the technological and institutional arts are branches of the same great tree of civilization, but unfortunately one branch grows faster than another. Technological progress today is rapid and easy. The development of institutional arts takes more patience and time. The United Nations experiment has encountered many difficulties in regulating and improving international relations. The success or failure of this worthy experiment may have a profound effect upon world production and trade.

In this realistic day and age, we dare not play the rôle of a Mad

Hatter in a geographical parody of Alice in Wonderland. We dare not explain diamond production without mention of the Diamond Corporation's tight-fisted monopoly. Neither can we explain the prewar Japanese steel industry without reference to governmental ownership and aid. Furthermore, in any regional survey, not until we understand human wants and human abilities can we say with certainty what a region's resources are.

CONCLUSIONS

Courses in economic geography should stress the interdependence of the physical and social sciences. The size, distribution, and economic structure of human groups should be studied in evolution. The dynamic nature of the resources available to man should be emphasized. Any realistic analysis of man's economic activities and problems must involve an appraisal not only of natural environment but of cultural environment, individual and group wants, and the technological and institutional arts.

As teachers of economic geography, let us remember that maps, charts, statistical tables, and factual data are merely tools for understanding nations, regions, industries, and men. Let us be realistic in our selection, organization, and interpretation of facts so that important ideas will emerge.[2] After the final examination in any course, mere facts are promptly forgotten. If we succeed as teachers, big ideas will remain.

Fundamentally, geographers, like historians, are teachers of human civilization. Today we see a world torn by conflict. We see at work the forces of knowledge and of ignorance, tolerance and bigotry, faith and doubt, efficiency and waste, abundance and scarcity, friendly cooperation and ruthless domination, good government and bad. These forces leave a heavy imprint upon the daily life of man.

It has been said that we know too much and care too little. Perhaps the greatest need of both teacher and student is a reappraisal of our spiritual resources, or a greater appreciation of moral values. As teachers, let us always remember that geography is much more than a bundle of environmental factors, that civilization is far more than a bagful of tricks.

[2] See J. Russell Smith, "What Shall the Geography Teacher Teach in the Elementary School? Teach Ideas and Teach Civilization," JOURNAL OF GEOGRAPHY, vol. 46, March, 1947, pp. 101-108.

VERNOR C. FINCH RECEIVES THE DISTINGUISHED SERVICE AWARD IN GEOGRAPHIC EDUCATION

The Distinguished Service Award, highest honor which the National Council of Geography Teachers can bestow, is given in recognition of outstanding service in the field of geographic education. It is with great pleasure that we announce the selection of Dr. Vernor C. Finch as 1950 recipient of the Award.

Dr. Finch's career of teaching, research and writing well exemplifies the Award's requirement of outstanding service to geographic education. No one has done more than he to provide the colleges of the country with well-organized, challenging, teaching material. Outstanding examples of geographic research, such as his meticulously detailed field study of Montfort, Wisconsin, and the monumental *Atlas of the World's Agriculture,* prepared in collaboration with O. E. Baker, as well as his editorship of the *Annals of the Association of American Geographers* and the many articles contributed to the JOURNAL OF GEOGRAPHY and many other geographic periodicals, have enriched geography classes for many years. His textbooks for colleges and high schools, *The Elements of Geography,* written in collaboration with Dr. Glenn Trewartha, and *Economic Geography,* co-authored with Dr. R. H. Whitbeck, and his series of wall maps and atlases have helped thousands to a clearer knowledge of the meaning and values of geography.

Dr. Finch's active participation in the meetings of the National Council of Geography Teachers, with a term as second vice-president, his loyal support of the Wisconsin Council of Geography Teachers and his presidency of the Association of American Geographers have materially advanced geographic education.

However, it is probably thru his influence as Chairman of the Geography Department of the University of Wisconsin that Dr. Finch's geographic and teaching philosophies have been spread most widely. His graduate students, now scattered thruout the entire United States and many foreign countries, respectfully remember that Dr. Finch's own classrooms were examples of his theories of vital and inspirational teaching of geography. His seminars inculcated high standards of thoroness of preparation and accuracy in presentation of geographic material. Dr. Finch's kindly interest in his students' professional welfare has helped produce a constant

flow of graduate students who are sensitive to teaching problems and who have been made to feel that teaching plays a very high role in our American society. The National Council of Geography Teachers is honored to be able to present this token of its appreciation of Dr. Finch's contributions.

ALISON AITCHISON, *Chairman*
GEORGE B. CRESSEY
HARRY O. LATHROP
J. RUSSELL WHITAKER
OTIS W. FREEMAN
LOYAL DURAND, JR.
M. MELVINA SVEC

JOURNAL OF GEOGRAPHY PRIZES

In January, 1947, we had the pleasure of announcing a series of prizes, to be awarded to contributors of outstanding articles that have appeared in the JOURNAL OF GEOGRAPHY. These prizes are made possible by the generous contribution of one of America's eminent geographers who insists on remaining anonymous. The donor is convinced: 1) "That the fine service contributed over the years by the editors of the JOURNAL merits far more recognition than it has received. These prizes honor them. 2) That the receipt of the prizes by the authors of the articles judged best will encourage these authors and other authors, with the results that additional excellent manuscripts will be offered for publication in the JOURNAL. 3) That public recognition of worthy achievement will help not only those who receive the recognition but also those who participate in any way. Indeed the public will think better of geography and of the JOURNAL when it learns of these prizes." Under the terms of the gift the President of the National Council of Geography Teachers is directed to appoint committees to make the award. The President is *ex officio* a member of each committee. Annually the recipients of the awards are announced by the editor at the National Council of Geography Teachers' banquet. Eight awards have now been established in honor of the following: Richard E. Dodge, Ray H. Whitbeck, George J. Miller, J. Paul Goode, Almon E. Parkins, Ellsworth Huntington, Isaiah Bowman, and Cora P. Sletten. Each recipient receives an award of twenty-five dollars.

RICHARD ELWOOD DODGE PRIZE, 1950

This prize, in honor of Professor Dodge, has been awarded to Dr. B. William Brierly for his article entitled "The Influence of Surface Features upon the Distribution of Malaria in Northwestern Mississippi." The selection was made from articles appearing during the last five years and dealing with some influences upon mankind of some aspect of physical geography, judged to have been helpful to the largest number of JOURNAL readers.

RALPH HUGHES WHITBECK PRIZE, 1950

This prize, in honor of Professor Whitbeck, has been awarded to E. Willard Miller for his article entitled "The Mineral Fuel Situation." The selection was made from articles appearing during the

last five years dealing with some influences upon mankind of some aspect of economic geography judged to have been helpful to the greatest number of JOURNAL readers.

The staff of the JOURNAL wishes to again take this opportunity to express its appreciation of the generous gift which has made it possible to honor Professor Dodge and Professor Whitbeck, who devoted many years to the advancement of geographic education.

ANNOUNCING

JOURNAL OF GEOGRAPHY—Geographic Education Prizes

We are especially happy to announce that a new series of JOURNAL OF GEOGRAPHY prizes has been established for the promotion of geographical education. These prizes have been set up by an eminent woman geographer who is a member of the National Council, and they are to honor women geographers and teachers of geography thruout the country. The specific conditions are as follows:

ELEMENTARY EDUCATION

A twenty-five dollar prize shall be awarded to the writer of the best article on Techniques in Teaching Geography in the Elementary School Level—first to the sixth grades inclusive. In 1951 the Committee shall examine the JOURNAL OF GEOGRAPHY issues of 1947-48-49-50 in selecting the prize winner. In 1953 and thereafter the prize shall be awarded to the best article appearing in the two previous years' issues, for example, the 1953 prize is to go to an article appearing in 1951-52 issues.

The President of the National Council of Geography Teachers shall appoint a committee of three to select the prize winning article. The committee shall consist of one elementary teacher, one college teacher specialist in geographic education, and one member of the editorial staff of the JOURNAL OF GEOGRAPHY. A member of the editorial staff shall announce the prize winner at the annual banquet of the National Council of Geography Teachers.

HIGH SCHOOL

A twenty-five dollar prize shall be awarded to the writer of the best article on Techniques in Teaching Geography in the High School Level—seventh to twelfth grades inclusive. In 1952 the Committee shall examine the JOURNAL OF GEOGRAPHY issues of 1947-48-49-50 in

selecting the prize winner. In 1954 and thereafter the prize shall be awarded to the best article appearing in the two previous years' issues, for example, the 1953 prize is to go to an article appearing in 1951-52 issues.

The President of the National Council of Geography Teachers shall appoint a committee of three to select the prize winning article. The committee shall consist of one high school teacher, one college teacher specialist in geographic education, and one member of the editorial staff of the JOURNAL OF GEOGRAPHY. A member of the editorial staff shall announce the prize winner at the annual banquet of the National Council of Geography Teachers.

THE NATIONAL COUNCIL AT WORK

The Distinguished Service Award of the National Council of Geography Teachers, the highest honor bestowed by the organization, was presented to Dr. Vernor C. Finch of the University of Wisconsin at the annual banquet on November 24.

The Committee on Survey of Research in Geographic Education hopes to complete its work by the end of 1951. The committee has presented a preliminary report, and has gathered a wealth of material since its inception in 1948. The Committee on Geographic Education in the Secondary School, likewise conducting a national survey, plans to finish obtaining its basic material within the year. The National Council looks forward to the completed reports of these two important committees.

The Committee on Compilation of Suggestions and Bibliography for use by Curriculum Committees has completed its report. The results of the work will appear as Professional Paper No. 12 of the National Council. Watch for announcements.

Professional papers 10, 11, and 12 are now in press or in manuscript form. Professional Paper 5 is out of print. Less than 100 copies apiece remain of Papers 6, 7, 8, and 9. If you wish these order now before the stock has been completely exhausted.

LOYAL DURAND, JR.
President

GEOGRAPHICAL PUBLICATIONS

Bernard Frank and Anthony Netboy. **Water, Land and People.** 329 pages, 42 illustrations. Alfred A. Knopf, N.Y., 1950. $4.00.

Water supplies for the future generations are decreasing at a frightening rate. We are destroying the effectiveness of the catch basins that supply the water and, in turn, we have lost much of the top soil, increased the floods, silted up our rivers and reservoirs and lowered the store of water. Frank and Netboy are sincerely disturbed by this and the first part of their volume, *Water, Land and People,* is as pessimistic as Vogt's *Road to Survival,* or Osborn's *Our Plundered Planet.* But unlike either, its beginning chapters are literally a textbook on the physiography of the relation of water and soils. And unlike either, the volume is filled with remedial solutions. The engineering solutions are considered as well as the land-use solutions, but they are only partial remedies. The authors favor a complete treatment of the river basin as in the Tennessee Valley. This project is praised but also the faults are pointed out. The Missouri River project is a subject for full discussion and the various plans as those of the Bureau of Reclamation and the Army Engineers criticized. The Pick-Sloan Plan for the MVA is told of and the Department of Agriculture's Land and Water Program come in for a good deal of praise. Further the Columbia River program is discussed. A final chapter is entitled, "Now is the Time," warning us that we must act immediately and change our cultural habits. The book is absorbing, and is scientifically written. It has a long and valuable list of annotations and an important bibliography. Besides being of interest to the general laymen, it is of great value to the engineer and the geographer as well as the public citizen involved in the making of plans for the conservation of water resources.

RODERICK PEATTIE

Ohio State University

Philip Lake. **Physical Geography.** Second Edition, 410 pp. Cambridge University Press. 1949, $3.50.

Professors J. A. Steers (editor), G. Manley, and W. V. Lewis have considerably revised this text, a standard work in Britain since the first printing in 1915. Several chapters have been added, old information has been brought up to date, and all new photographs have been introduced. Professor Lake died in 1949 and had had no part in the revision.

The material is divided into three parts: Part I, The Atmosphere; Part II, The Ocean; Part III, The Land. A welcome note is the devotion of almost as much space to the ocean (93 pp.) as is given the atmosphere and land, an unknown phenomenon in current American physical geography texts. Descriptions of ocean bottom terrain and a 27-page exposition of the current tidal theories are highlights. Some other interesting items are the explanation of the effects of heat upon pressure and winds by diagrams showing isobaric surface fluctuations and the description of shingle and sand spit evolution as exemplified along the English coast. All 47 plates in the text are remarkably sharp. Concluding is a brief bibliography of the most basic and current English, American, German, and French sources.

Much of the lucidity of Professor Lake's classroom approach has been retained. Over 230 diagrams and sketch maps are featured. Emphasis is on explanation of physical processes. On the other hand, one might wonder why so very little space is given to the distributional and descriptive aspects of climate and landforms, although this fact is more than compensated for by the great amount of explanatory material. The omission of a discussion of soils and vegetation and the general treatment of air pressure before, rather than after, temperature seem more questionable. Nevertheless, this book remains an invaluable aid to any who desire uninvolved answers to more of the "why's" that continually trouble beginners in physical geography.

HOWARD F. GREGOR

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